



# Volunteer Lake Assessment Program Individual Lake Reports

## WICWAS LAKE, MEREDITH, NH

### MORPHOMETRIC DATA

Watershed Area (Ac.):	5,312	Max. Depth (m):	10.9	Flushing Rate (yr <sup>-1</sup> )	2
Surface Area (Ac.):	328	Mean Depth (m):	3.9	P Retention Coef:	0.58
Shore Length (m):	9,500	Volume (m <sup>3</sup> ):	5,110,500	Elevation (ft):	502

### TROPHIC CLASSIFICATION

Year	Trophic class
2009	MESOTROPHIC
2009	MESOTROPHIC

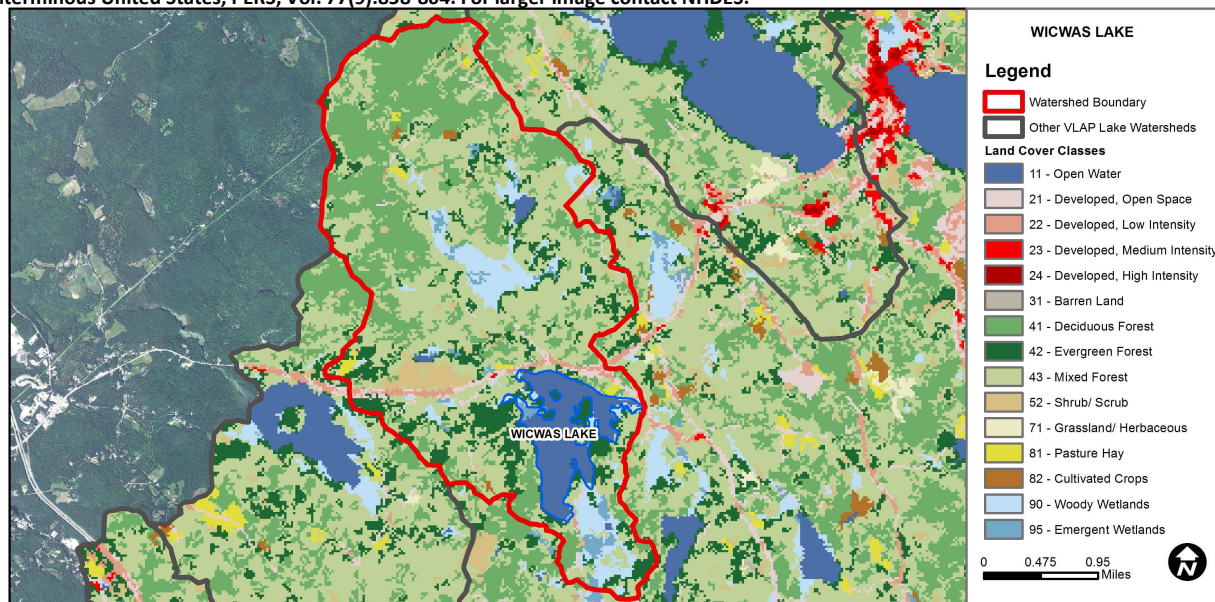
### KNOWN EXOTIC SPECIES


The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Good	>=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

### WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	6.47	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	1.73	Deciduous Forest	26.65	Pasture Hay	0.59
Developed-Low Intensity	0.92	Evergreen Forest	12.49	Cultivated Crops	0.24
Developed-Medium Intensity	0.02	Mixed Forest	39.88	Woody Wetlands	6.75
Developed-High Intensity	0	Shrub-Scrub	2.66	Emergent Wetlands	1.57



# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

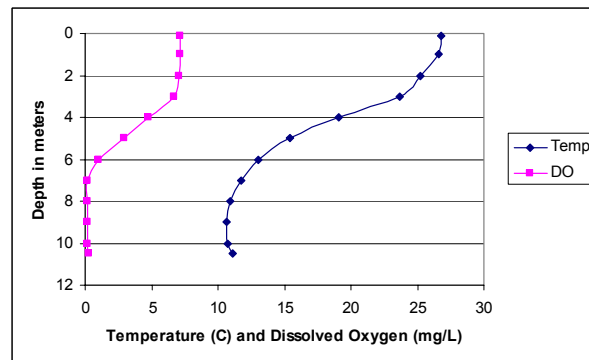
## WICWAS LAKE, MEREDITH, NH

### 2012 DATA SUMMARY

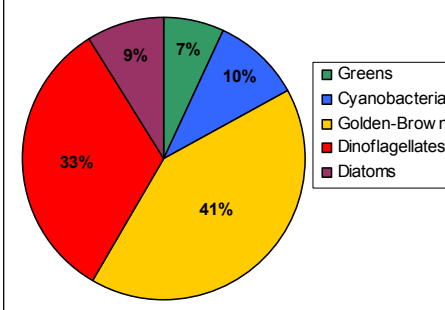
#### OBSERVATIONS AND RECOMMENDATIONS (Refer to Table 1 and Historical Deep Spot Data Graphic)

- ♣ **CHLOROPHYLL-A:** Chlorophyll levels were average for most NH lakes, however chlorophyll has increased steadily since 2009. Historical trend analysis indicates chlorophyll levels tend to fluctuate from year to year.
- ♣ **CONDUCTIVITY/CHLORIDE:** Spring chloride sampling was conducted and levels were elevated at the Chemung Wetland and Lakeland School stations likely due to road and parking lot salting practices. Conductivity and chloride at the remaining stations are slightly greater than the NH lake median values.
- ♣ **E. COLI:** E. coli levels were low and well below state standards at all stations.
- ♣ **TOTAL PHOSPHORUS:** Epilimnetic (upper water layer) phosphorus levels were low and below the NH lake median. Historical trend analysis indicates epilimnetic phosphorus tends to fluctuate from year to year. Hypolimnetic (lower water layer) phosphorus was slightly elevated, turbidity was also elevated, and oxygen levels were very low indicating potential internal phosphorus loading from the sediments. Outlet phosphorus was elevated potentially due to dry weather and low flow conditions.
- ♣ **TRANSPARENCY:** Transparency improved slightly from 2011 and was greater than the NH lake median. Historical trend analysis indicates transparency fluctuates from year to year.
- ♣ **TURBIDITY:** Metalimnetic (middle water layer) turbidity was slightly elevated likely due to a layer of algae. Hypolimnetic turbidity was elevated due to either bottom sediment contamination and/or the accumulation of organic compounds under oxygen depleted conditions.
- ♣ **pH:** pH levels were less than desirable in the metalimnion and hypolimnion.
- ♣ **RECOMMENDED ACTIONS:** Increase monitoring frequency to three sample events per summer to better assess summer water quality and historical trends. Discuss utilizing salt alternatives and calibrating salt spreaders during the winter months with the Lakeland School and Town to help decrease chloride contributions.

#### Dissolved Oxygen & Temperature Profile



#### Wicwas Lake Phytoplankton Population



Station Name	Table 1. 2012 Average Water Quality Data for WICWAS LAKE									
	Alk.	Chlor-a	Chloride	Cond.	E. Coli	Total P	Trans.		Turb.	pH
	mg/l	ug/l	mg/l	uS/cm	#/100ml	ug/l	m		ntu	
							NVS	VS		
Chemung Wetland			56							
East Cove				57.0	10	5			0.48	6.76
Deep Epilimnion	4.9	4.45	7	58.1		6	4.20	4.20	0.67	6.50
Deep Metalimnion				58.1		12			1.20	5.86
Deep Hypolimnion				60.8		17			3.68	5.86
Lakeland School			30							
Launch Ramp			7							
Outlet			6	59.8	10	33			1.29	6.51
Rte 104 Inlet			8	56.7	10	6			0.67	6.69
West Cove			8	57.1	10				1.95	6.79

**NH Water Quality Standards:** Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

**Chloride:** < 230 mg/L (chronic)

**E. coli:** > 88 cts/100 mL – public beach

**E. coli:** > 406 cts/100 mL – surface waters

**Turbidity:** > 10 NTU above natural level

**pH:** 6.5-8.0 (unless naturally occurring)

**NH Median Values:** Median values for specific parameters generated from historic lake monitoring data.

**Alkalinity:** 4.9 mg/L

**Chlorophyll-a:** 4.58 mg/m<sup>3</sup>

**Conductivity:** 40.0 uS/cm

**Chloride:** 4 mg/L

**Total Phosphorus:** 12 ug/L

**Transparency:** 3.2 m

**pH:** 6.6

#### HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation
Chlorophyll-a	Variable	Data fluctuate annually, but are not significantly increasing or decreasing.
Transparency	Variable	Data fluctuate annually, but are not significantly increasing or decreasing.
Phosphorus (epilimnion)	Variable	Data fluctuate annually, but are not significantly increasing or decreasing.

This report was generated by the NH DES Volunteer Lake Assessment Program (VLAP). For more information contact:  
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#### Historical Deep Spot Chlorophyll-a, Epilimnetic Total Phosphorus & Transparency Data

